Risk factors associated with spatio-temporal clusters of high mortality in Danish swine herds

Lopes Antunes, Ana Carolina; Ersbøll, Annette; Bihrmann, Kristine; Toft, Nils

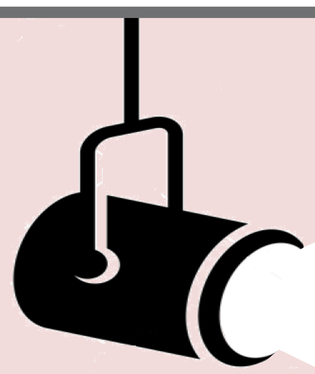
Publication date:
2017

Document Version
Publisher's PDF, also known as Version of record

DTU Vet
National Veterinary Institute

Risk factors associated with spatio-temporal clusters of high mortality in Danish swine herds

Ana Carolina Antunes[1*], Annette Ersbøll[2], Kristine Bihrmann[2], Nils Toft[1]



What were our motivation and objective?

- Mortality data are recorded to fulfill the European Commission requirements which ensures a continuous data flow for a surveillance system.
- Before using these data as part of a syndromic surveillance system, it is necessary to understand why increasing changes in mortality happen.
- The aim of this study was to identify spatio-temporal clusters of high mortality in Danish swine herds and associated risk factors.

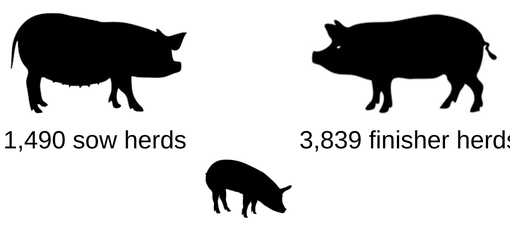
How did we do it?

1. Data extraction → 2. Data management → 3. Spatio-temporal cluster analysis → 4. Logistic regression models

Extraction of the no. of animals moved from farms to rendering plants.

Swine movement database

5,010 farms were included in the analysis from December 2013 to October 2015. The mortality was calculated for three age groups separately:

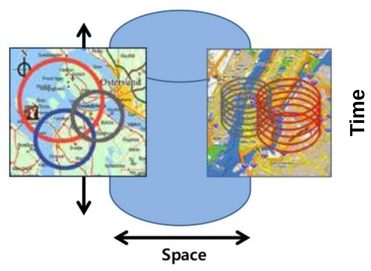


1,490 sow herds

3,839 finisher herds

1,896 weaner herds

A retrospective space-time scan statistic was used to identify local spatio-temporal clusters of high mortality for each age group.

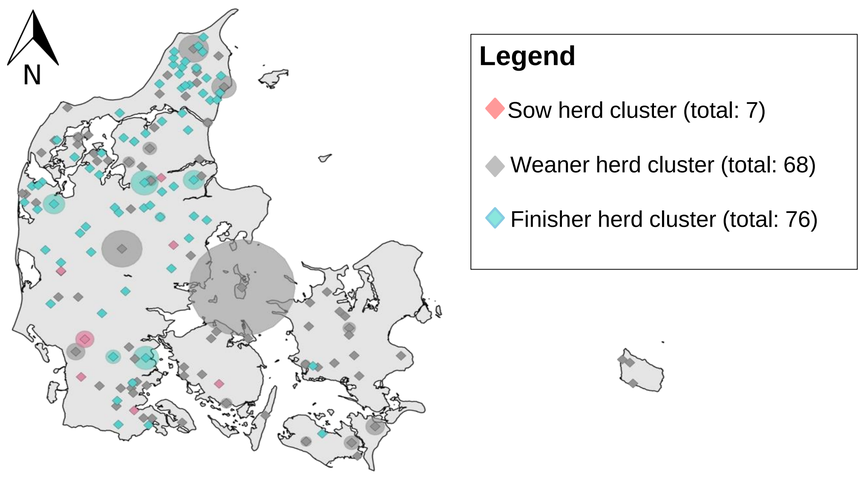


Source: https://www.slideshare.net/ILRI/gis-training-72928777

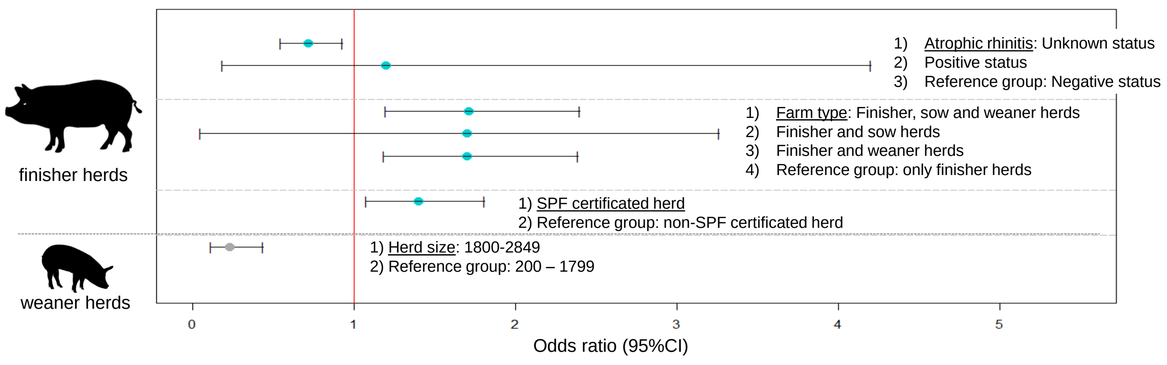
These models were used to assess the potential <u>risk factors</u> associated with herds being inside vs outside the clusters:

- ❖Farm type and herd size
- ❖Specific Pathogen Free (SPF) certificate
- ❖Atrophic rhinitis status
- ❖PRRS status
- ❖Enzootic pneumonia status
- ❖Porcine pleuropneumonia status

Findings



Location of the spatio-temporal clusters of high mortality in Danish swine herds between December 2013 and October 2015 for the different age groups.



Univariable logistic regression on the association between significant risk factors ($p<0.05$) and the probability of weaner or finisher herds being inside vs outside clusters of mortality. No significant risk factors were found for sows.

Conclusions

- **The detected clusters might not be due to disease, but the result of changes in herd management and legislative rules.**
- **It is therefore necessary to follow-up on any detected clusters of high mortality when using these data in a surveillance system before taking any disease control actions.**

*Corresponding author:
Ana Carolina Antunes
Postdoc Researcher
ECVPH resident

Phone: +45 35 88 68 58
Email: aclan@vet.dtu.dk

[1] National Veterinary Institute
Technical University of Denmark
www.vet.dtu.dk

[2] National Institute of Public Health
University of Southern Denmark
http://www.si-folkesundhed.dk/

Relevant topics of the poster for the ECVPH:

- •Population medicine
- •Spatial epidemiology
- •Biostatistics
- •Monitoring and surveillance systems
- •Scientific communication

Scan me with your smartphone